ENVIROCON, INC.

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ENVIROCON, INC.

February 26, 1991
ENV #140101F02

Solid and Hazardous Waste Bureau
Department of Health and
Environmental Sciences
Cogswell Building
Helena, Montana 59620

Attention: Mr. John Wadhams

Subject: January 1991 Ground Water Sampling Results - Livingston Rail Yard

Dear John:

Burlington Northern Railroad Co., through its contractor Envirocon, Inc., had five ground water samples analyzed as part of the January 1991 monthly sampling round. Four of the samples were collected at Wells 89-2, LG-10 (two samples), and the B Street Municipal Well, and one sample was a trip blank.

All samples were analyzed at Energy Laboratories, Inc. in Billings, Montana. The B Street Well sample was analyzed for volatile organic compounds (VOCs) by EPA Method 524.2 and the other samples were analyzed for purgeable halocarbons by EPA Method 601.

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There were no detectable VOCs or purgeable halocarbons found in the samples collected during the January 1991 sampling round or in the trip blank. Enclosed are complete sample analytical results.

If you have any questions or comments about this data, please contact me at your convenience.

Sincerely,

ENVIROCON, INC.

John Mills
Hydrogeologist

Kris Kok

Kris Kok
Project Manager

JPM/pm
Attachments
cc: Mel Burda
Dennis Iverson
Steve Pilcher
Mike Stevenson
Missoula file

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LIVINGSTON MT 59047

Water Analysis

PROJECT: Livingston / BN

B-Street

LAB NO.	91-2823	91-2824	91-2825
SAMPLE IDENTIFICATION	140101-640	140101-642	140101-643
SAMPLE SUBMITTED	01/28/91	01/28/91	01/28/91
DATE REPORTED	02/07/91	02/07/91	02/07/91
SAMPLE DATE	01/24/91	01/25/91	01/25/91
SAMPLE TIME	1615	1645	1700
CONSTITUENT	ug/l	ug/l	ug/l
Benzene	<0.50	<0.50	<0.50
Bromobenzene	<1.0	<1.0	<1.0
Bromochloromethane	<1.0	<1.0	<1.0
Bromodichloromethane	<1.0	<1.0	<1.0
Bromoform	<1.0	<1.0	<1.0
Bromomethane	<1.0	<1.0	<1.0
n-Butylbenzene	<1.0	<1.0	<1.0
sec-Butylbenzene	<1.0	<1.0	<1.0
tert-Butylbenzene	<1.0	<1.0	<1.0
Carbon tetrachloride	<0.50	<0.50	<0.50
Chlorobenzene	<1.0	67	37
Chloroethane	<1.0	<1.0	<1.0
Chloroform	<1.0	<1.0	<1.0
Chloromethane	<1.0	<1.0	<1.0
2-Chlorotoluene	<1.0	79	38
4-Chlorotoluene	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	<1.0	<1.0	<1.0
Dibromochloromethane	<1.0	<1.0	<1.0
1,2-Dibromoethane	<1.0	<1.0	<1.0
Dibromomethane	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	2.7	1.7
1,3-Dichlorobenzene	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	<0.50	2.8	1.7
Dichlorodifluoromethane	<1.0	<1.0	<1.0
1,1-Dichloroethane	<1.0	<1.0	<1.0
1,2-Dichloroethane	<0.50	<0.50	<0.50
1,1-Dichloroethene	<0.50	<0.50	<0.50
cis-1,2-Dichloroethene	<1.0	540	270
trans-1,2-Dichloroethene	<1.0	5.9	2.3
1,2-Dichloropropane	<1.0	<1.0	<1.0

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Water Analysis

PROJECT: Livingston / BN

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B sheet

LAB NO.	91-2823	91-2824	91-2825
SAMPLE IDENTIFICATION	140101-640	140101-642	140101-643
SAMPLE SUBMITTED	01/28/91	01/28/91	01/28/91
DATE REPORTED	02/07/91	02/07/91	02/07/91
SAMPLE DATE	01/24/91	01/25/91	01/25/91
SAMPLE TIME	1615	1645	1700
CONSTITUENT	ug/l	ug/l	ug/l
1,3-Dichloropropane	<1.0	<1.0	<1.0
2,2-Dichloropropane	<1.0	<1.0	<1.0
1,1-Dichloropropene	<1.0	<1.0	<1.0
cis-1,3-Dichloropropene	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	1.4	<1.0
Hexachlorobutadiene	<1.0	<1.0	<1.0
Isopropylbenzene	<1.0	<1.0	<1.0
p-Isopropyltoluene	<1.0	<1.0	<1.0
Methylene chloride	<1.0	<1.0	<1.0
Naphthalene	<1.0	3.2	<1.0
n-Propylbenzene	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<1.0	<1.0
Tetrachloroethene	<0.50	41	14
Toluene	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	<1.0	<1.0	<1.0
Trichloroethene	<0.50	27	11
Trichlorofluoromethane	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene	<1.0	2.1	<1.0
1,3,5-Trimethylbenzene	<1.0	<1.0	<1.0
Vinyl chloride	<0.50	<0.50	<0.50
Xylenes	<1.0	6.0	3.1

REMARKS: Sample was properly preserved and in specified container. Sample was analyzed in accordance with EPA Method 524.2.

Q.A. Review:

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Water Analysis

89-2 26-10

PROJECT: Livingston / BN

		Duplicate
LAB NO.	91-2822	91-2820
SAMPLE IDENTIFICATION	140101-641	140101-638
SAMPLE SUBMITTED	01/28/91	01/28/91
DATE REPORTED	02/07/91	02/07/91
SAMPLE DATE	01/24/91	01/24/91
SAMPLE TIME	1710	1540
CONSTITUENT	ug/l	ug/l
Purgeable Halocarbons EPA Method 524.2		
Bromodichloromethane	<1.0	<1.0
Bromoform	<1.0	<1.0
Bromomethane	<1.0	<1.0
Carbon tetrachloride	<0.50	<0.50
Chlorobenzene	<1.0	<1.0
Chloroethane	<1.0	<1.0
2-Chloroethylvinyl ether	<1.0	<1.0
2-Chlorotoluene	<1.0	<1.0
Chloroform	<1.0	<1.0
Chloromethane	<1.0	<1.0
Dibromochloromethane	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<1.0
1,3-Dichlorobenzene	<1.0	<1.0
1,4-Dichlorobenzene	<0.50	<0.50
1,1-Dichloroethane	<1.0	<1.0
1,2-Dichloroethane	<0.50	<0.50
1,1-Dichloroethene	<0.50	<0.50
cis-1,2-Dichloroethene	<1.0	<1.0
trans-1,2-Dichloroethene	<1.0	<1.0

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Water Analysis

PROJECT: Livingston / BN

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89-2 LG-10 LD

		Duplicate
LAB NO.	91-2822	91-2820
SAMPLE IDENTIFICATION	140101-641	140101-638
SAMPLE SUBMITTED	01/28/91	01/28/91
DATE REPORTED	02/07/91	02/07/91
SAMPLE DATE	01/24/91	01/24/91
SAMPLE TIME	1710	1540
CONSTITUENT	ug/l	ug/l
Purgeable Halocarbons EPA Method 524.2		
1,2-Dichloropropane	<1.0	<1.0
cis-1,3-Dichloropropene	<1.0	<1.0
trans-1,3-Dichloropropene	<1.0	<1.0
Methylene chloride	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<1.0
Tetrachloroethene	<0.50	<0.50
1,1,1-Trichloroethane	<0.50	<0.50
1,1,2-Trichloroethane	<1.0	<1.0
Trichloroethene	<0.50	<0.50
Trichlorofluoromethane	<1.0	<1.0
Vinyl chloride	<0.50	<0.50
Dichlorodifluoromethane	<1.0	<1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.

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Water Analysis

PROJECT: Livingston / BN

LAB NO.	91-2819	91-2820	91-2821
SAMPLE IDENTIFICATION	140101-637	140101-638	140101-639
SAMPLE SUBMITTED	01/28/91	01/28/91	01/28/91
DATE REPORTED	02/07/91	02/07/91	02/07/91
SAMPLE DATE	01/24/91	01/24/91	01/24/91
SAMPLE TIME	1220	1540	1545
CONSTITUENT	ug/l	ug/l	ug/l
Purgeable Halocarbons EPA Method 524.2			
Bromodichloromethane	<1.0	<1.0	<1.0
Bromoform	<1.0	<1.0	<1.0
Bromomethane	<1.0	<1.0	<1.0
Carbon tetrachloride	<0.50	<0.50	<0.50
Chlorobenzene	<1.0	<1.0	<1.0
Chloroethane	<1.0	<1.0	<1.0
2-Chloroethylvinyl ether	<1.0	<1.0	<1.0
2-Chlorotoluene	<1.0	<1.0	<1.0
Chloroform	<1.0	<1.0	<1.0
Chloromethane	<1.0	<1.0	<1.0
Dibromochloromethane	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	<0.50	<0.50	<0.50
1,1-Dichloroethane	<1.0	<1.0	<1.0
1,2-Dichloroethane	<0.50	<0.50	<0.50
1,1-Dichloroethene	<0.50	<0.50	<0.50
cis-1,2-Dichloroethene	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	<1.0	<1.0	<1.0

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Water Analysis

PROJECT: Livingston / BN

LAB NO.	91-2819	91-2820	91-2821
SAMPLE IDENTIFICATION	140101-637	140101-638	140101-639
SAMPLE SUBMITTED	01/28/91	01/28/91	01/28/91
DATE REPORTED	02/07/91	02/07/91	02/07/91
SAMPLE DATE	01/24/91	01/24/91	01/24/91
SAMPLE TIME	1220	1540	1545
CONSTITUENT	ug/l	ug/l	ug/l
Purgeable Halocarbons EPA Method 524.2			
1,2-Dichloropropane	<1.0	<1.0	<1.0
cis-1,3-Dichloropropene	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	<1.0	<1.0	<1.0
Methylene chloride	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<1.0	<1.0
Tetrachloroethene	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	<1.0	<1.0	<1.0
Trichloroethene	<0.50	<0.50	<0.50
Trichlorofluoromethane	<1.0	<1.0	<1.0
Vinyl chloride	<0.50	<0.50	<0.50
Dichlorodifluoromethane	<1.0	<1.0	<1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.

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WATER VOLATILE SURROGATE RECOVERY

PROJECT: Livingston/BN

SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#
91-2819	110	94	100
91-2820	110	96	110
91-2820 dup	110	93	120
91-2821	110	95	120
91-2822	110	89	110
91-2823	100	96	110
91-2824	100	94	120
91-2825	110	95	110

	QC LIMITS
S1 (TOL) = Toluene-d8	80-120
S2 (BFB) = Bromofluorobenzene	80-120
S3 (DCE) = 1,2-Dichloroethane-d4	80-120

Column to be used to flag recovery values with an asterisk

* Values outside of contract required QC limits

Q.A. Review: _____

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QUALITY ASSURANCE-SPIKED ANALYSIS

PROJECT: Livingston/BN

Lab No. 91-2821 was spiked with the following constituents with these results.

Constituent	Spike Amount, ug/l	P (%)	Range for P (%)
1,1-Dichloroethene	5.0	130	60-140
Benzene	5.0	120	60-140
Trichloroethene	5.0	120	60-140
Toluene	5.0	120	60-140
Chlorobenzene	5.0	100	60-140

P = Percent recovery measured.

Q.A. Review: Joe Sparks